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THE MACHINE TOOL INDUSTRY IN THE USSR

26 December 1951

Notes

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The machine tool is the only device which not only produces other machines but also reproduces itself. Without the machine tool it would be impossible to produce most of our everyday necessities and luxuries, not only those products whose metal parts obviously have been produced on the machine tool but also those which in finished form give no clues as to the part played by the machine tool in their manufacture. Automobiles, airplanes, ships, mining equipment, and petroleum equipment are all made by machine tools or machines made on machine tools. With the aid of these tools and machines, forests are converted to lumber, rubber to automobile tires, and raw cotton and wool to clothing. The level of a nation's industrialization depends in large measure, therefore, upon the national inventory of machine tools and the ability to produce them.

A study of the machine-tool industry gives an insight into the economic stability, economic potentiality, and vulnerability of a country as well as specific information on its ability to produce the machine tool itself and general information on its ability to produce all necessary machinery and equipment.

II. History of the Industry.

The Soviets are fully aware that the nation possessing the largest inventory of machine tools and the ability to produce them has at its disposal one of the keys to national power. Stalin at the 14th Council of National Economy stated as follows: "They (the authors of the Dawes Plan) would have liked to limit us to the production, let us say, of cotton print, but this is not enough for us. We want to produce not only cotton print but also the machine necessary for its production. They would have liked us to limit our production, let us say, of automobiles, but this is not enough for us, for we want to produce not only automobiles but the machines that will produce automobiles. To change our country from an agrarian to an industrial one, able to produce necessary equipment by its own efforts -- this is the gist, the basis of our general policy."

Before the Revolution, Russia, having a somewhat primitive agricultural economy, had few uses for machine tools. Machine tools were used primarily in the arsenals, railroad shops, mining equipment repair shops, ship repair yards, textile maintenance shops, and in a few metalworking shops of small importance. There were several small plants that made simple lathes and drill presses on more or less of a job basis, but most requirements were filled by imports. It is estimated that pre-Revolution machine building of all kinds, including machine tools, accounted for only 6.8 percent of total Russian industrial production.

At the meeting of the 14th Congress of the Communist Party in December 1925 a resolution was adopted to industrialize the USSR, initiating an accelerated program of development for machine building, particularly machine tools. The Soviets used the US as their model for industrialization. Although realizing that it would be necessary to import machine tools from foreign countries for many years not only for immediate production but also for purposes of design, the Soviets planned for ultimate self-sufficiency in the production of machine tools, as in all industrial plans.

In the early days of the Five Year Plans the question arose of separating machine-tool building as an independent branch from machine building. Beginning with the organization of the Machine Tool Building Trust in 1929 and the transfer of all machine-tool building plants to it, Soviet machine-tool building developed rapidly into one of the leading branches of machine building. Later, the Peoples Commissariat of Machine Tool Building, organized in 1941, united under one organization the production of metal-cutting tools, cutting and measuring tools, abrasives, forging and press machinery, and a number of plants making related products. At about this same time the machine-tool building plants also were trying to convert from a job-shop basis to series production based upon standardization of models and the specialization of certain plants in making one general type of machine tool, such as lathes, milling machines, and grinders.

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During the First and Second Five Year Plans, while the new machine-tool plants still were in the designing stage or attempting to perfect production, a significant number of machine tools produced in the USSR were made in plants in other branches of industry such as aviation, armament, general machine building, local industry, and industrial cooperatives. In most cases the industries required the machine tools for their own operation and expansion. Pressure from higher authority often forced plants to make copies of machine tools presently in their shops so that they might meet the Plan goals for the items for which they were responsible. As machine-tool plants came into production, however, the manufacture of machine tools by other plants became less frequent and by 1951 had virtually ceased. Some potential for the manufacture of machine tools in such plants still exists, however, should the emergency require it.

Postwar developments have included the rebuilding of the damaged machine-tool plants, the erection of new plants, and the installation of power equipment in many of the older plants. Specialized foundries also have been set up to supply the machine-tool industry, and other plants have specialized in manufacturing component parts for machine tools on a standardized basis. The use of tungsten-carbide tooling is being stressed, causing emphasis to be placed on adapting machine tools for high-speed operation. While the greater percentage of machine tools being built in the USSR are of the general-purpose type (lathes, milling machines, shapers, drill presses, and grinding machines), considerable attention has been given to the design and production of special-purpose machine tools and transfer machines for performing multiple operations.

In the last 25 years the USSR has made great strides in building up its machine-tool industry. Its importance has been recognized by the appointment of Efremov, formerly Commissar of Machine Tool Building, as Deputy of the USSR Council of Ministers. The use of machine tools by Stakhanovites is featured constantly in the daily press, and many "Heroes of the Soviet Union" are machine-tool operators. Today the Soviet machine-tool industry has entered into a new phase, and for the first time the USSR possesses an integrated core of specialized plants.

III. Organization and Operation.

1. Organization.

Under the Ministry of Machine Tool Building of the USSR, eight main administrations have been identified as follows:

- Abrasives Production
- Forging and Press Machine Building
- Heavy Machine Tool Industry
- Machine Tool Industry
- Sale of Products of Ministry of Machine Tool Building
- Machine Tool Supply
- Supporting Industries for Machine Tool Building
- Tool Industry

Seventy plants are known to be associated with the Ministry, and 20 others probably are associated. About 60 of the 70 known plants of the Ministry are producing machine tools.

2. Technology.

a. Technical Instruction.

The USSR has only a few teachers in engineering whose experience and training were received before the 1930's. Technically trained instructors capable of turning out competent engineers are few, and their qualifications and facilities often are poor. Foreign studies on engineering, however, have been freely available, and many of these studies have been translated into Russian

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with appropriate modifications to suit the prevailing Soviet political beliefs. Large quantities of US technical journals, for example, as well as those periodicals of the various US trade associations and industries, are widely distributed in the USSR not only to the various schools but also to the libraries of the industries, ministries, and individual plants.

To supplement the training of its engineers, the USSR, during the 1930's and during the war period, sent many of its engineers to the US, ostensibly as inspectors in the machine-tool and other industries but actually to observe the manufacturing methods used in the production of US equipment. Many of these engineers displayed theoretical knowledge but in nearly every case showed a lack of practical experience. Few of these engineers remained in the US very long and after being moved from plant to plant returned to the USSR and were replaced by other Soviet engineers, somewhat on rotation. While the US manufacturers in most cases were agreeable to having the Soviets on their premises, there were numerous instances where they prevented the Soviet engineers from learning certain production operations. The Soviets profited by their stay in the US plants, however, and most of them returned home with copious notes of what they had seen.

Before World War II the technical publications of the USSR were made up mainly of articles translated from foreign publications and often went so far as to credit the article to the US or British publication in which it originally appeared. Of late, however, articles by Soviet technicians have been featured. Articles and the photographs contained in foreign technical publications are scanned avidly by the technical and factory workers who are permitted to see them, and these workers are encouraged to adapt to their own particular work any new methods thus learned. If successful, they may be honored by being named as a Stakhanovite (shock worker) or even attain the rating of "Hero of the Soviet Union," thus obtaining the rights and privileges that accompany these ratings. Some of the results so obtained are subsequently published in the newspapers and in the technical journals and frequently are filmed in the USSR equivalent of "News of the World." In many such cases, increased production results.

As part of the education for greater production throughout the USSR, workers who have raised their production above their norms and have introduced Stakhanovite methods in their own factories often are sent to other factories to demonstrate these new methods. Great strides are being made, but much remains to be done. It is significant that the amount of technical literature on machine tools in Russian is rapidly increasing.

The campaign for industrial education, intensified since World War II, has been confronted with the problem of converting the peasant from an agricultural to an industrial worker and of inculcating him with a pride for machine and factory similar to his feeling for land and animals. In contrast to such industrial countries as the US, Switzerland, and Germany, where a mechanic keeps his machine clean and in good working condition, the Soviets do not take any such care of their equipment. Moreover, since the Soviet machine-tool industry is only in its infancy, there is no tradition of skill to be handed down from father to son. In the US machine-tool plants, for example, many operations requiring considerable hand skill are jealously guarded and passed on from generation to generation. This also is true in Switzerland in the manufacture of fine-quality precision machinery. In the USSR, on the other hand, hereditary skills and pride of accomplishment in mechanical arts are rare, the emphasis being placed on fulfilling norms and quotas.

Another problem in improving technical skill is the lack of practical shop experience in the case of Soviet engineers. In contrast to the US, where engineer graduates often serve an apprenticeship in a plant, learning the work from the ground up, Soviet graduates usually are started in a plant in an executive position of assistant foreman, acting as supervisor over a department.

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As a result, they have little opportunity to acquire a firsthand knowledge of the shop and machines. There also is the fear, as in other oriental countries, that they may lose face if they perform manual tasks. In turn, this utilization of engineering graduates in executive positions halts the advancement of capable workers. A further difficulty is that many of the political hacks appointed to administrative positions have no technical background.

Despite these problems connected with technical improvement, the Soviets undoubtedly are attaining some knowledge in the manufacture of machine tools. However, the modern finished product which, in contrast with the three- or four-thousandth tolerance required a generation ago, now requires tolerances of only a few tenths of a thousandth, and it is difficult to believe that the present generation of machinists in the USSR will be able to compete with the machinists employed in US machine-tool plants.

b. Development.

The types of machine tools built in the USSR up until the late 1920's were of the crudest variety. Most of the lathes, for example, were incapable of cutting a thread and did not have a built-in lead screw. In the early 1930's, attempts were made to modernize the types of machine tools being produced, and a variety of new models were brought out during that period, incorporating some of the more modern foreign improvements. Foreign manufacturers were required to submit with their machine tools not only operating manuals but in many cases detailed assembly drawings on the grounds that the machines shipped to the USSR could be repaired when necessary. These working drawings, however, became the properties of the ministries or of their research divisions. Only rarely were they made available to the factories to which the machines were shipped. Research institutions thus had the basic drawings on which they could start their modernization programs for their own machine tools. In many cases these institutions have gone so far as to adopt the name of the foreign manufacturers. In a recent technical publication, for example, photographs were shown of a newly designed machine which appears to be almost an exact copy of the US-made Pratt-Whitney-Keller milling machine. Another example is the manufacture of special production machines designed to drill, ream, and tap multiple holes of such items as automobile or tractor cylinder blocks. Although considerable emphasis during the postwar period has been placed upon increased production of this type of equipment, a search through the current literature published by the Soviets has failed to reveal much information on original designs or new developments by the USSR.

During the postwar period, considerable emphasis has been placed on the use of carbide tooling, with resulting increases in the speed of cutting. Stakhanovites who have thus increased the speeds on their machines have been given country-wide publicity, and all factory workers have been encouraged to do likewise. Attention has been given to the incorporating of additional horsepower motors so that more chips can be removed. The Soviet factory workers were late in discovering the ratio of horsepower to the cubic inches of metal removed per minute. In the US it was found necessary to redesign many of the machine tools (by "beefing them up") to take care of the increased horsepower, stresses, and wear that accompany the use of carbide tools. Only now is it becoming apparent that in the USSR the accelerated depreciation of Soviet machine tools due to the useage of carbide tooling is becoming a serious problem.

The Ministry of Machine Tool Building has under its jurisdiction several research institutes which are charged with the development and design of new types of machine tools. Although the engineering departments of US machine-tool plants constantly are forced, through competition, to redesign and improve their machine tools, in the USSR there is the tendency for a design, once approved by the Ministry of Machine Tool Building and allocated to one or more factories for production, to become frozen to that particular model.* Often the users of the machine tools have little or nothing to say about the type of machine which is allocated and which sometimes may not suit the work involved. Although the USSR

* For high-speed cutting, designs are only modified.

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probably will continue to be backward in designing machine tools, in recent years the number of designs of the various types of machine tools has increased. In 1932 there were only 49 different types and sizes of machine tools, but the 1950 Plan called for the production of 2,300 type-sizes.

3. Input Requirements.

Materials required to manufacture machine tools in the USSR include principally cast iron, steel, and smaller quantities of copper, lead, and other nonferrous metals. In addition to metals, certain components such as antifriction bearings, electric motors, controls, drive belts, and way wipers are needed. At the current estimated rate of production the following materials or components in 1950 were required:

Estimated Input Requirements for the Soviet Machine Tool Industry 1950

<u>Material or Component</u>	<u>Amount</u>
Steel and Cast Iron	255,000 Metric Tons
Copper and Brass	2,900 Metric Tons
Antifriction Bearings	650,000 Units
Electric Controls and Motors	325,000 Horsepower
Drive Belts and Wipers	200,000 Pounds of Rubber

It has been estimated elsewhere that the machine-tool industry of the US requires two-tenths of 1 percent of the steel output, 2.5 percent of the motors and electric controls (1 horsepower and over), and 2 percent of the antifriction bearings.

The input requirements above are not large with respect to their over-all availability in the USSR. The only input item which is imported by the Soviets is rubber. For machine-tool use, however, synthetic rubber is satisfactory.

The labor input for the maintenance of the current level of output is believed to be high. The plant-by-plant total of Soviet manpower employed in installations producing machine tools is estimated at 101,000 workers. The US, however, employed only about 60,000 workers to produce the same number of units. While plants in the USSR are known to engage in such miscellaneous production as agricultural spare parts to an extent not undertaken in the US, a lowered output per worker is indicated and is an index of the Soviet machine-tool industry's relative inefficiency.

IV. Availabilities.

1. Production.

In 1950 it is estimated, as the result of a plant-by-plant survey*, that the machine-tool installations in the USSR produced 67,236 units (plus or minus 10 percent). Of these units, from 2,000 to 5,000 are estimated as being special-purpose machine tools and the balance general-purpose. The 1950 Plan called for 61,700 general-purpose units and 12,300 special- and multipurpose units, or a total of 74,000 units. The USSR therefore has substantially

* Appendix A shows the method used to compute Soviet production of machine tools. Appendix B lists the machine-tool plants in the USSR with estimated production of each as of January 1951.

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fulfilled the 1950 production goal for general-purpose units but has failed to attain the goal for special-purpose units. For the postwar period, Soviet production of machine tools, based on a projection, is estimated as follows:

Estimated Soviet Production of Machine Tools
Postwar Period

Year	Units (Full Capacity)		
	General-purpose	Special-purpose	Total
1946	30,000	0	30,000
1947	40,000	500	40,500
1948	50,000	1,000	51,000
1949	55,000	2,000	57,000
1950	61,700	3,000	64,700

Both the projection and the plant-by-plant estimates are in relatively close agreement. This rate of production compares favorably with the US and the UK, each of which currently produces at the rate of from 60,000 to 70,000 machine tools a year.

Approximately 80 percent of current Soviet machine-tool production is carried on in plants under the Ministry of Machine Tool Building. The production of machine tools before World War II was largely under the Commissariat for Heavy Machine Building, responsible for 60 percent of production. Thus there is an increasing trend toward the centralization of production under the Ministry of Machine Tool Building. As for geographical concentration, an estimated 50 to 60 percent of current production takes place in the Central Industrial Region.

No plan of machine-tool production by categories has been published by the USSR. The pattern of US production in 1945, however, is as follows:

US Machine Tool Production
1945

Category	Percent of Total Production
Agricultural Machinery	3.2
Mining and Oil Well Construction	2.3
Metalworking Machinery	6.4
Special Industry Machinery	6.1
General Industrial Equipment	5.1
Office and Store Machinery	2.1
Domestic and Service Equipment	3.1
Electrical Equipment	9.7
Miscellaneous	
Machine Parts and Jobbing	4.8
Shipbuilding and Ordnance	14.6
Motor Vehicles and Parts Machinery	8.0
Aircraft and Aircraft Parts Machinery	2.5
Railroad Equipment	1.1
Fabricated Metal Products	25.7
Precision Mechanisms	5.3
	100.0

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Although requiring adjustment in order to apply to the USSR with its emphasis on munitions, the above breakdown of US production is at present the best available yardstick with which to judge the Soviet pattern of production by category.

2. Stockpiles.

The Soviet machine-tool industry lacks the potential capacity to expand rapidly in an emergency. In contrast, the US, now producing at the rate of from 60,000 to 70,000 units per year, under the pressure of war was able in 1942 to produce 307,000 machine tools. With this as a standard of comparison, the Soviet stockpiles of machine tools for war reserve would need to be large. No satisfactory estimates, however, are available as to the number required.

3. Substitutes.

While there often is discretion as to which particular type of unit to use in machine operations, there is no substitute for the machine tool. Work performed by single-purpose machines may be accomplished on general-purpose machine tools, but it can be done only with lowered efficiency.

V. Soviet Machine Tool Park.

1. Inventory.

Although large amounts of machine tools obtained through reparations were significant in the postwar recovery of Soviet industry, they were received in such quantities that they could not be absorbed. Also, as part of the Soviet inventory, the full effectiveness of this equipment must be qualified, since much of the dismantled equipment was used equipment and consequently in various stages of disrepair. Rough handling in transit and improper storage precautions against weather exacted a heavy toll, some of the special units were not readily adaptable for operations at the plants to which they were sent, and improper distribution led to shipments of equipment to areas where it was not needed. An estimated 55,000 units were received by the USSR through Lend Lease from November 1940 to December 1944. This figure was equalled by Soviet production during the same period and enabled total losses of inventory to be held at only 43,600 units. Thus Lend Lease equipment, together with dismantled machine tools, formed the nucleus of industrial rehabilitation.

The Soviet machine-tool park currently is showing signs of becoming an increasing source of difficulty. Improper use, improper lubrication and maintenance, lower technical abilities of the average machine operator, pressures of Stakhanovism, and inadequate supplies of suitable replacement parts for the large percentage of foreign machinery in operation (estimated at over 50 percent of total inventory) have accelerated depreciation. Because of these factors and because the Soviets operate their equipment longer and in a more depreciated state than does the US, the replacement of the existing machine-tool inventory will consume an ever-increasing share of new production.

Estimates of the USSR's current inventory of machine tools run from a low of about 600,000 units to the 1,300,000 estimate made by Voznesensky. The figure of about 1 million units is believed to be approximately correct. In comparison, in 1949 the US had an estimated inventory of 1,760,000 machine tools.

2. Replacement Parts.

Obtaining machine-tool replacement parts has been a problem in the USSR for a long time. The production of replacement parts for those machine tools produced in the USSR has not proceeded smoothly in the postwar period, and the extensive effort to standardize equipment has had questionable success.

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A further difficulty in the problem of replacement parts is that more than one-half of the present Soviet machine-tool park is estimated as being of foreign manufacture. These tools were acquired through imports, Lend Lease, and reparations.

Although from the 1930's through the Lend Lease period the Soviets often insisted that complete stocks of replacement parts be provided with each foreign machine tool, the major portion of the large number of tools acquired through reparations did not include replacement parts.

The problem of keeping in operation the existing machine tools in the USSR is therefore most difficult, particularly stocking parts for the thousands of different foreign makes. Some of the representative types of replacement parts required by the Soviets for machine tools of foreign make are as follows:

- a. Bearings: ball, roller, needle, plain, special oil.
- b. Gears: spur, helical, herringbone (either as single gears or as gear clusters).
- c. Shafts: hardened and ground, special alloy steels, case-hardened, slotted or splined.
- d. Levers and handles.
- e. Lead screws.
- f. Spindles and centers.
- g. Replaceable bedways: hardened and ground.
- h. Clutches and brakes.
- i. Pulleys and V-belts.
- j. Special motors and controls.
- k. Special screws, bolts, and bushings.

While some of these items can be produced by the Soviets, the others are so specialized that it is necessary to order them directly from the foreign manufacturer or to cannabilize from similar makes in the USSR.

The problem of spare parts in the USSR is expected to become increasingly acute and may result in considerable contraction of the total inventory of machine tools.

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APPENDIX A

METHOD USED TO COMPUTE SOVIET PRODUCTION OF MACHINE TOOLS

The method used to arrive at an over-all estimate of Soviet production was primarily to study each machine-tool installation. Several excellent reports on the more important plants were available, and prisoner-of-war interrogations were invaluable. These interrogation reports proved more useful for a study of the machine-tool industry than for other fields of equipment, for each prisoner of war seemed to possess some background knowledge of the industry. In arriving at production estimates for the individual plants, Plan goal fulfillment figures were instrumental in determining the level of performance. In some cases, Soviet press data enabled a production figure to be arrived at which could be compared directly with known production data. Frequently, no production information from prisoners of war was available, and the estimate of a particular plant's output became highly subjective. In order to arrive at an estimate in such instances of a particular plant, the number of workers, the percentage of Plan figures, the physical condition of the plant, supply conditions, and especially the type of unit in production were used to relate the plant to another plant whose production might be known. In determining the types of units being produced, translations of Soviet periodicals and catalogs were the principal sources of information.

The total production figure was examined in the light of its historical probability, about which substantial information is available. The production figure also was examined with reference to Plan goals. The over-all Plan fulfillment figure was reasonably consistent.

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APPENDIX B

MACHINE TOOL PLANTS IN THE USSR a/
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<u>Plant and Location</u>	<u>Types of Machine Tools Produced</u>	<u>Estimated Plant Production</u>	<u>Remarks</u>
<u>Northwest Region</u>			
1. Automatic Machine Tool Plant* Leningrad	Automatic shaping and longitudinal turning lathe, Model 1104	1939 950 units	Founded shortly before World War II; machinery and personnel evacuated during the war but returned thereafter; plant only slightly damaged; resumed prewar production in 1946; 1,600 employees in May 1949; criticized for inefficiency during early 1949; electromechanical grinder used in 1949; breakdown of 1948 assignments led to a surplus of parts and finally to a financial crisis; 1950 production planned 6 times greater than in 1946; P. Khizhnyak was Director in Dec 1949; 15 new-type automatic machine tools in 1950.
AFC: I-153	Automatic shaping and cutting-off lathe, Model 1106	1947 350 units	
RFSR	Automatic shaping and longitudinal turning lathe, Model 110	1948 500 units	
	Automatic lathe, Model 112	1950 800 to 1,200 units	
	Automatic lathe, Model 1117		
	Wire-drawing machines		
	Longbed automatic LA-1 lathes, capacity 25 to 36 mm. in diameter		
	Other special machines for motor vehicle and radio industry		
	Automatic grinding machines planned		

a. Plants of the Ministry of Machine Tool Building are indicated by one asterisk; probable plants, by two asterisks.
AFC refers to US Air Force Map which divides the USSR into economic regions and subdivisions.
Tonnages are in metric tons.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Northwest Region</u>			
2. Kirov Metallurgical and Machinery Plant* Leningrad APC: I-153 RSFSR	Combination lathes b/ Drill presses b/ "Aggregate" lathes b/ c/	1950 500 units	Not primarily a machine-tool plant; principal production is tanks, other armaments, and tractors; also produces tube coilers and foundry molds.
3. Machine Tool Foundry "Lenstankolit" (formerly "Tsentrolit") Leningrad APC: I-153 RSFSR	Castings only for machine tools	1946 4,200 tons 1947 4,300 tons 1948 4,800 tons 1950 5,500 tons (Approximately 5 lathe bed castings a day)	Quality of castings not good; high percentage of rejects in 1949; A. V. Evdokimov was Chief Engineer in 1949; supplies castings mainly to machine-tool building plants; being equipped with new foundry machinery in 1949; 1,000 employees in 1947.

b. Probably produced.

c. "Aggregate" is a Soviet term used somewhat ambiguously, and its meaning is not exactly clear. There are at least three possible definitions.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Northwest Region</u>			
4. Sverdlov Machine Tool Plant* Leningrad APC: I-153 RSFSR	Horizontal boring machines, Models 2620, 2631, 2620 Profile milling machine, Model 6441A Semiautomatic millers, 22 Models Horizontal boring mill, Model 2523 Horizontal boring mill, Model 2520 Horizontal boring mill, Model 2521	1939 700 units 1947 180 units 1948 400 units 1950 550 to 650 units	Displayed boring machine, Model 2620, at Bucharest, Rumania, in Nov 1948; boring machines for boring cylinders of steam engines (Nov 1949); failed to meet 1949 Plan; plant area, 250 x 300 meters; Model 6441A produced in 1947 is intended for production of jet engine blades and other duplicate milling from a master (by Apr 1949, 40 had been produced); castings are supplied from "Jenstankolli Works"; plant begun in 1931, heavily damaged during the war; rebuilt and being enlarged in 1949; prewar output planned to be reached in 1951; 1,500 employees in Dec 1948; exceeds present metal-cutting speeds; Kovalchuk was director in 1949.
5. Il'yich Machine Tool Plant* Leningrad APC: I-153 RSFSR	Universal grinder B, Typo 3464 Groove grinder, semiautomatic machines, Models V-1 (648), N-1 (649) Broach grinding machine, Model 360 Circular saw sharpening machine, Model 3692	1939 400 to 600 units 1947 340 units d/ 1948 100 units e/ 1950 500 to 600 units	Speeded up production in 1949; builds grinding machines for bearing vises; Makushimets is Director; planned to build optical profile grinders in 1950; first semiautomatic machines tools for superfinishing ball bearings were made in 1950; 600 workers in 2 shifts in 1949; planned to transfer the production of universal grinding machines to another plant and to concentrate on special machines.

d. Composed of 290 universal units and 50 semiautomatic units.

e. These units are special semiautomatic.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>West Region</u>			
6. Machine Tool Plant "Kirov" Gomel	Shapers, mainly Models 7A36 and 737 Planers Slotting machines	1948 320 units 1949 480 units 1950 680 units (Plan)	Badly damaged during the war; rebuilt and in operation in 1946; reached prewar production in 1948; employs from 300 to 500 workers; one source states 1950 target as 1,000 shapers; believed to be high; also produces hand tools.
AFC: II-168 White Russian SSR			
7. Machine Tool Plant "Proletariy" Gomel	Centerless grinders	N.A.	In production in 1949.
AFC: II-168 White Russian SSR			
8. Machine Tool Plant "Voroshilov" Minsk	Planer, Model 7231A Radial drills	1939 480 units 1950 500 units	1,000 employees; damaged during the war; restored in 1947; high-speed hydraulic and electric-drive planers (1949).
AFC: II-168 White Russian SSR			
9. Machine Tool Plant "Kirov" Minsk	Cutting-off machine, Model 866 Lathes Drill presses Milling machines Saws 5-ton millers Horizontal broaching machines, Models 7A10M, 7520, 7530M Gun-rifling machines Vertical broaching machine, Model 7705	1939 900 units 1950 800 to 1,000 units	Damaged during the war and restored in 1947; has own foundry; 1949 planned production of 1 1/2 times 1948 could not be met; employed POW's; operates three 8-hour shifts, 7 days a week; made armor plate in 1949; only one type of lathe in production in 1949; also produces armor plate for tanks.
AFC: II-168 White Russian SSR			

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Plant and Location	Type of Machine Tools Produced	Estimated Plant Production	Remarks
West Region			
10. Grinding Machine Works Mogilev	Grinders	1950 100 units	Resumed production in 1948.
AFC: II-167 White Russian SSR			
11. Machine Tool Plant "Kirovna" Vitebsk	Drill presses Grinders 1. Face grinding machine, Model 3316H 2. Rough grinding machine, Model 3334 3. Surface grinding machine, Model SK-371 Lathes Hilling machines Thread rollers Piston ring grinder, Model 339	1939 3,000 units 1950 2,000 units	Damaged during the war, fully restored in Jun 1948; 2,500 workers in 1948.
AFC: II-167 White Russian SSR			
12. Machine Tool Plant "Kominintern" Vitebsk	Polishing lathes Radial drills, Models 2B53, 355, 2A592 Bench drilling machine, Model SN12A Vertical drilling machines, Models 2118, 2121, 2135	1950 150 units	1948 target reached in Oct 1948.
AFC: II-167 White Russian SSR			

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<u>Plant and Location</u>	<u>Types of Machine Tools Produced</u>	<u>Estimated Plant Production</u>	<u>Remarks</u>
<u>West Region</u>			
13. Machine Tool Works "Zhalgiris" Vilnius	Bench drills	1950 400 units	1949 Plan called for production of some 700 machine tools (200 units over 1948 Plan); horizontal milling machines planned for 1949; 1949 Plan also called for production of 2,000 electric motor frames; also produces tank bogie wheels.
AFC: II-168 Lithuanian SSR			
<u>South Region</u>			
14. Machine Plant "Kaganovich" Dnepropetrovsk	Slotters Vertical drills	1949 2,260 units 1950 2,500 units	500 workers in 3 shifts; also produces electric saws, 10- to 12-ton hammers, and parts for tractors.
AFC: III-234 Ukrainian SSR			

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
South Region			
15. Kharkov Cylindrical Grinding Machine Plant "Molotov" Kharkov AFC: III-234 Ukrainian SSR	Cylindrical grinding machines, Models 3151, 316M, 3164 Grinding machine for regrinding crankshaft journals, Model 3420 Grinding machine for grinding crankpins, Model 3421 Machine for regrinding crankshafts, Model 3423 Machine for regrinding camshaft cams, Model 3430 Machine for regrinding camshaft cams, Model 3433 Machine for grinding large ball-bearing races, Model 3488A Rotary type grinder, Model 3498A Radial drills Polishing machines	1937 1,750 units (Plan) 1938 1,129 units 1939 1,500 units (Plan) 1939 1,300 units 1950 1,000 units	Constructed during first Five Year Plan; damaged during the war; repaired in 1944; made polishing machines for large bearings in 1947.
16. Machinery Plant "Gidroprirod" Kharkov	Hydraulic drives for machine tools	N.A.	Supplied 4,000 hydraulic apparatus to Moscow plants in 1947.
AFC: III-234 Ukrainian SSR			
17. Electric Tool Plant "Electroinstrument" Kharkov	Electric drills Electric hammer, Model I-33 Tube-cutting machines	N.A.	Fulfilled Five Year Plan for gross production in 1949.
AFC: III-234 Ukrainian SSR			

<u>Plant and Location</u>	<u>Types of Machine Tools Produced</u>	<u>Estimated Plant Production</u>	<u>Remarks</u>
<u>South Region</u>			
18. Machine Tool Plant "Gorki"*** Kiev AFC: III-233 Ukrainian SSR	Automatic lathe, Model 1261M Automatic lathe, Model 1261P Turret lathe, Model 1336M	1939 450 units 1942 900 units (Plan) 1950 1,000 units	Damaged during the war; repaired and in production in 1946; reported in 1946 that production would be double prewar by 1950.
19. Machine Tool Plant "Kommunar" Luhny AFC: III-233 Ukrainian SSR	Screw-cutting lathe, Model 1617 Turret lathes Lathes Rough grinding machine, Model 3327 Rough grinding machine (spindle), Model 3A332 Suspended-type rough grinder, Model 3374K Rough grinder with flexible shaft, Model 3382 Tool-grinding machine, Model 3628 Rough grinders, Models 3M634, 3M636 Milling heads semiautomatic for grinding, Model 3667 Belt polishing grinder, Model 3890	1939 500 to 600 units 1942 1,000 units (Plan) 1946 150 to 250 units 1947 400 units (Plan) 1950 500 to 600 units	Constructed prior to 1918; enlarged later; badly damaged during the war; restored in 1946; 600 workers in 1946.
20. Kramatorsk Heavy Machine Tool Plant* Kramatorsk AFC: III-234 Ukrainian SSR	Ingot-cutting machine, Model 1865 Wheel-turning lathe, Model 1936 Roll-turning lathe, Model 1945 Roll-turning lathe, Model 1A947 Drill presses	1950 500 units	Reported 8,000 workers in 3 shifts in 1949; construction work finished in 1949; also produces electric motors and small tools.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>South Region</u>			
21. Machine Tool Plant "Stalin" Novograd-Volynsk AFC: III-233 Ukrainian SSR	Lathes	1948 150 units 1950 (Plan) 200 units	Also produces industrial trucks and hoisting equipment.
22. Machine Tool Plant "16th Party Congress" Odessa AFC: III-250 Ukrainian SSR	Radial drills, 3-in. cap, Type 253 Multispindle (22 spindles) drilling machines Diamond-drilling machines	1939 250 units 1948 800 to 1,000 units 1950 1,500 units	Constructed before 1918; enlarged and improved later; Sulesberg is Director; about to mass-produce machine tools in Dec 1946; employed 1,000 workers in 1949; equipment from Borsigwalde, Germany; also produces forging presses.
23. Machine Tool Building Plant "Lenin" Odessa AFC: III-250 Ukrainian SSR	Screw-cutting lathe, Model 162 Combination lathe, Model S-195 Vertical diamond-boring machine, Model 2697 Single-spindle vertical honing machine, Model 383 Single-spindle vertical machine, Model 34833	1939 1,756 units	Possibly same plant as above.
24. Milling Machine Plant "Kirov" Odessa AFC: III-250 Ukrainian SSR	Universal milling machines, Models 678M, 679 Drill presses Pantograph engraving machines, Models 6461, 6463	1950 200 units	Has four workshops; universal miller has two spindles, one horizontal and one vertical; production of the universal milling machine was planned for 3 units a month in 1949; also produces agricultural machinery parts.

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<u>Plant and Location</u>	<u>Types of Machine Tools Produced</u>	<u>Estimated Plant Production</u>	<u>Remarks</u>
<u>South Region</u>			
25. Machine Building Plant "Knybishyeva" Preskurov APC: III-233 Ukrainian SSR	Lathes	1945 50 to 60 units per month 1950 800 units	Partly destroyed by Germans; reconstructed and in production in 1945.
26. "23rd of October" Plant* Melitopol APC: III-249 Ukrainian SSR	Automatic thread-cutting machines	1950 200 units	In production in 1950.
27. Machine Tool Plant Kishinev APC: III-250 Moldavian SSR	Lathes	1946 225 units 1950 300 units	
<u>Southeast Region</u>			
28. "Krasny Metallist" Machinery Plant Stavropol (formerly Voroshilovsk) APC: IV-249 RSFSR	Lathes Drill presses Band saws	1950 300 units	Had 16,000 employees, 3 shifts in 1941; large producer of munitions in 1941; foundry cast 100,000 tons in 1940; no plant information since 1942; lathes, presses, and saws produced may not be machine tools; there is a possibility they might be woodworking tools; also repairs motor vehicles and tractors.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Southeast Region			
29. Machine Tool Plant "Sedin" Krasnodar AFC: IV-249 RSFSR	Universal turret lathe, Model 152 Vertical boring mills, Models 152, 153, 1A55, 1A56, 1A57	1939 540 units 1948 400 units 1950 600 units	Employed about 1,000 in 1949; seriously damaged during the war; back in produc- tion in 1944; construction still in progress in 1949; handicapped other plants by not meeting 1948 Plan.
30. Machine Tool Building Plant Novocherkassk* AFC: IV-249 RSFSR	Turret lathe, Model 1318	1950 400 units	No plant information since 1944; mentioned in 1949 catalog as producing lathes.
31. Lathe Works "Frunze" Maikop AFC: IV-249 RSFSR	Lathes	1950 400 units	Built after 1918; damaged during the war; again in operation; has an apprentice school; fulfilled first half of 1950 Plan; lathes may be for woodworking; also produces instruments and clay mixers.
32. Machine Tool Plant "Yperod" Taganrog AFC: IV-249 RSFSR	Type unknown	N.A.	Press mentioned that plant fulfilled 1947 Plan.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Transcaucasus Region</u>			
33. Casting and Mechanical Works "Tsentrolit" Tbilisi APC: V-325 Georgian SSR	Lathes (T-4A) Machine-tool castings Bolt-cutting machines Boring machines Chucks	1947 2,800 tons f/ 1948 (6 months) 1,600 tons 1950 3,500 tons	Started in 1949 to make Model T-4A universal lathe; probably destroyed during the war and rebuilt in 1947; castings of good quality; supplies the "Kirov" and "Stanok" plants in Tbilisi; employs 640 workers, including 140 POW's in two 8-hour shifts in 1949.
34. Machine Tool Plant "Kirov" Tbilisi APC: V-325 Georgian SSR	Screw-cutting lathe, Model 1D63A Centerless roughing machine, Model 175 Sphere-turning lathe, Model TT-4 Screw-cutting lathe (T-CHA) File-cutting machines Threading machine, Model 507V Vertical six-spindle nut-tapping machine, Model 508 Pipe-threading machine, Model 914B Pipe cutting-off machines, Models 9153, 93155 Sleeve cutting-off machines, Models 9163, 93165 Straightening and burnishing machine, Model 389	1939 650 units 1942 900 units 1946 300 units (Plan) 1946 425 units 1947 598 units 1948 725 units 1950 900 units	1,500 employees in 1944; made grenades during the war; exceeded Plan in 1948; new workshops added; gets castings from "Tsentrolit," Tbilisi; 600 employees in 1948; being further expanded in 1948; reportedly will be completed in 1951; Dip 300 lathes now main production; only plant in USSR producing Dip 300 lathes, according to press in Jun 1950; Meladze is Director.

f. Tonnage production given applies only to machine-tool castings. It is not known how many units of all types were produced by the plant.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Transcaucasus Region</u>			
35. Machine Tool Plant "Stanok"*** Tbilisi AFC: V-325 Georgian SSR	Threading machine, Model 5A07 Universal thread-rolling semi-automatic machine, Model 5933 Belt-threading machine, Model 9101B	1949 20 units (Plan for 6 mos.) 1947 132 units 1948 125 units (Jan-Oct) 1950 250 units	Constructed during the war; exceeded Plan for first 9 months of 1948; 170 employees in 1948; Bokeriya is Director, and Kabobsdze is Chief Engineer; may expand plant and equipment in 1950.
36. Machine Tool Plant "Dzerzhinskiy"*** Yerevan AFC: V-325 Armenian SSR	Lathes Screw machines	1946 182 units 1947 324 units 1950 500 units	Plant started in Jul 1946; exceeded Plan for 1947; labor productivity down in Jun 1949; has own foundry; during the war produced trench mortars; developed its first screw-cutting lathe in Dec 1949 and is tooling up for mass production; reportedly equipped with first-class precision machine tools.
<u>Volga Region</u>			
37. Machine Tool Plant "Mashinostroyenka" Kuibyshev AFC: VI-165 RSFSR	Short- and long-thread milling machines Lathes Bolt-cutting and combination machines Planers (shapers)	1939 800 units 1940 2,150 units (Plan) 1941 2,450 units (Plan) 1950 1,000 units	3,600 employees in 1937; converted to munitions production in 1941 and made machine-gun wrenches, 300 a shift; castings faulty; 40 percent rejects in 1949; made machine-gun shields in 1949; 2,500 workers in 1948; planers produced at the rate of 26 a month in 1948.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Volga Region</u>			
38. Middle Volga Machine Tool Plant "Srednevolzhskiy" Kuibyshev AFC: VI-165 RSFSR	Screw-cutting lathe, Model 1615M Screw-cutting lathe, Model 1616 Thread-milling machines, Models 561, 5MB62 Spline-milling machines, Models 5617, 5618	1950 700 to 1,000 units	Produced 255 lathes over 1947 target; also produces tractor parts.
39. Machine Building Plant No. 525 Kuibyshev-Bezymyanka AFC: VI-165 RSFSR	Planer (shaper), Model SFS.03 Milling machines	1950 650 units	From 300 to 600 workers; also makes aircraft machine guns and dairy separators.
40. Gear Machine Plant UL Lenin 103** Saratov AFC: VI-165 RSFSR	Gear-cutting machines Drill presses	1942 900 units 1942 (Plan) 1950 150 units 800 units	2,000 employees in 1941; under construction in 1939; concentrating on gear-cutting machines in 1946; for the first half of 1948, output 1 1/2 times higher than in similar period in 1947; output tripled between 1945 and end of 1949; in Sep 1949, construction in progress.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Volga Region			
41. Machine Tool Plant No. 311* Astrakhan Street Sarátov APC: VI-235 RSFSR	Shapers Lathes Drill presses Hilling machines Grinding machines Watch-spring grinders Internal grinding machines, Models 2A240, 2A251 E/ Turret lathes Grinding machines Gages	1947 480 units 1949 1,000 units 1950 1,500 units	400 employees in two 8-hour shifts in 1946; in 1947, 535 employees, including 35 POW's in 2 shifts, 6 days a week; 1,000 workers in 1949 in 2 shifts; has foundry, machine shop, and assembly shop; 50 percent of castings defective; made 37-mm. antitank gun shells during the war; equipped with German machinery.
42. Machine Tool Plant "Volodarskiy" No. 3 Ulyanovsk APC: VI-165 RSFSR		1950 200 units	Made munitions before and during the war; reportedly assembling DV-01 lathes in 1946; capacity, 200 lathes a year.
43. Machine Tool Plant Kamyshin APC: VI-235 RSFSR	Broaching machines Die slotters	1950 200 units	Under construction in 1942; no further information.

8. It has not been possible to check whether these machines were produced at this plant or at the other plant at Sarátov, listed above.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Central Industrial Region			
44. Machine Tool Plant Dmitrov* AFC: VII-154 RSFSR	Planers Milling machines: 1. Horizontal, Model 680M 2. Vertical, Model 610G 3. Keyway, Model 692A	1950 1,500 units	Had 6,000 employees in 3 shifts in 1941; plant housed in temporary buildings built about 1935 and still in use in 1948; fulfilled 1949 Plan by 31 Oct 1949.
45. Milling Machine Works No. 113 (GZFS)* Gorki AFC: VII-154 RSFSR	Slab-milling machines, Models 6G55, 6G65, 66A3, A666 Console milling machines, Models 6820 (682), 683, 615, 6812, 6882, 6W82, 6W12, 6W13 Copying slab miller, Model PKF 12 Thread millers (without console) Wheel lathes (in 1937) Wheel lathes (in 1939) Drum-type milling machine, Model 6O22 Vertical milling machine, Model 6W12 Two-spindle circular milling machine, Model 621 Two-spindle circular milling machine, Model 623 Planomilling machine for machining tubings, Model 6AS5 High-speed vertical milling machine, Model 6A54 Single-spindle planomilling machine, Model A662V Two-spindle planomilling machine, Model A662 Three-spindle planomilling machine, Model A663G Four-spindle planomilling machine, Model N/A Universal and horizontal milling machine, Model 6W82G	1939 3,250 units 1940 4,400 units 1948 5,600 units 1950 7,000 units	Constructed between 1934 and 1948 and still being expanded; had 6,000 employees in 3 shifts in 1948; planned capacity 8,000 units a year; casts from 30,000 to 50,000 tons of steel a year; did not meet Plans for 1947 and 1948; rejects very high in 1949; has own foundry; turned out tank parts during the war for Tank Works No. 112 at Gorki.

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<u>Plant and Location</u>	<u>Types of Machine Tools Produced</u>	<u>Estimated Plant Production</u>	<u>Remarks</u>
<u>Central Industrial Region</u>			
46. Textile Machinery Plant Ivanovo AFC: VII-154 RSFSR	Lathes	1947 100 units 1950 200 units	Principal production textile machinery; under Ministry of Machine and Instru- ment Building, Main Administration for Textile and Light Industry Machinery; employs 2,300 workers, including 300 POW's; has dismantled German equipment.
47. Machine Tool Plant "Lepeev" Kirov AFC: VII-155 RSFSR	Lathes Drill presses	1942 1,400 units 1950 1,500 units	
48. Machine Tool Plant "Autopribor" or OSPO Vladimir AFC: VII-154 RSFSR	Lathes Planers Grinding machines Milling machines	1943 700 units 1950 400 units	No information later than 1943; plant name, "Auto Instruments," indicates that it may now make parts for Gorki Auto Plant.
49. Instrument Plant of the Gilevchasprom Moscow AFC: VII-167 RSFSR	Machine tools and instruments for watch industry	N.A.	Under Ministry of Machine and Instrument Building, Main Administration for the Watch Industry.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Central Industrial Region			
50. Moscow Appliances Factory "Priisposobleniye" Moscow APC: VII-167 RSFSR	Pneumatic chucks, Models TS-240 (3-jaw), TS-325 (3-jaw), TS-380 (4-jaw)	1949 50,000 to 60,000 units, valued at 7.7 million rubles 1946 units to the value of 3.9 million rubles 1948 units to the value of 5.8 million rubles	Small plant; made machine guns during war; failed to meet 1946 Plan. 600 workers in 2 shifts; I. Khodorov is Director -- re- placed Radchenko in 1947; castings come from Moscow "Stankolite" plant; supplies major machine-tool producers; under Main Administration for Supporting Industries for Machine Tool Building, Ministry of Machine Tool Building.
51. Machine Tool Factory "Stankokonstruktziya" Moscow APC: VII-167 RSFSR	Internal grinders Involute milling machines Drilling equipment Hydraulic broaching machines Transfer machine lines	N.A.	Plant is experimental factory of the Experimental Scientific Research Institute for Metal-cutting Machine Tools (ENIMS); machines for production of pistons for motor cars; handicapped other plants by not fulfilling 1948 Plan for special machines.
52. Stankolit Works* Moscow APC: VII-167 RSFSR	Machine-tool castings	1947 10,000 units 1950 12,500 units	Supplies Moscow machine-tool factories with castings; completed in 1934; A.F. Ryabtshev is Director; about 3,000 workers in 1949.

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Plant and Location

Central Industrial Region

53. Machine Tool Plant
"Krasny Proletariy" *
Moscow

AFC: VII-167
RSPSR

Types of Machine Tools Produced

Vertical six-spindle semiautomatic lathe, Model 1A283
Vertical six-spindle semiautomatic lathe, Model 1284
Screw-cutting lathe, Model 1A62
Screw-cutting lathe, Model 1620
Multicutter semiautomatic lathe, Model 1720
Multicutter semiautomatic lathe, Model 1730
Multitool semiautomatic lathe for machining camshafts, Model 1891
Multitool semiautomatic laths for machining camshafts, Model 1892
Multitool semiautomatic lathe for machining camshaft cams, Model 1893
Multitool semiautomatic lathe for machining camshaft cams, Model 1895
Multicutter semiautomatic lathe for roughing railroad car axles, Model 183
Multitool semiautomatic lathe for finishing railroad car axles, Model 183A
Multitool semiautomatic lathe for machining railroad car axles, Model 1830
Semiautomatic lathe for boring center holes in locomotive axles and cut-off operations, Model 1831
Semiautomatic lathe for rough machining of locomotive axles, Model 1832

Estimated Plant Production

1940 4,000 units
1945 5,100 units
1948 6,300
to
1950 6,500 units
7,000 units

Remarks

900 machine tools produced in 1948 above planned target; attained 1950 level of production; 15 new types of machine tools scheduled for 1949; conveyorized production lines totaling 400 meters in length installed in 1949; "Vic" lathe put into serial production in 1949; during the war made submarine guns; leading and oldest plant in the industry; average monthly output reported in Sep 1948 to be three times that of 1940 and 30 percent above 1947; produced an experimental thread-cutting lathe, Model 1620, in Dec 1949, which included a copying unit; 1949 output of screw-cutting lathes, Model 1A62, 10 times more than 1949 Plan; gets castings from "Stankoliz" factories in Moscow and Leningrad, bearings from State Bearing Plants Nos. 1 and 2 in Saratov and from No. 6 in Sverdlovsk; failed to meet quotas in Jul, Sep, and Nov 1949, although met the 1949 total Plan; A.I. Vorobyev is Director; employs 6,500 workers on 3 shifts; prior to World War I this plant was called "Bromley" and made simple-type machine tools; 1950 Plan 20 percent over 1949.

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<u>Plant and Location</u>	<u>Types of Machine Tools Produced</u>	<u>Estimated Plant Production</u>	<u>Remarks</u>
Central Industrial Region			
53. Machine Tool Plant "Krasny Proletariy" Moscow (Continued)	Multitool semiautomatic lathe for finishing locomotive axles, Model 1833 Roll lathe for turning and rolling wheel-pair journals, Model 1835 Universal relieving lathe, Model K96 Semiautomatic multitool lathe, Model 184 Universal lathes, Models Dip 20 (discontinued 1944), Dip 200, Dip 300, ID 64, ID 65 (heavy), and Dip 162M Special multitool lathe for crankshafts, Model 132 Special multitool lathe for connecting rods, Model 134 Special multitool lathe for crankshafts (large), Model 135 Special multitool lathe for crankshafts, Model 136 Special heavy thread-cutting lathe for gun barrels up to 6 meters, Model 141 Special lathes: Model 142 for gun barrels, Model 91 (MK 71-73) for cams, and Model MT-31 for projectile heads		

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Central Industrial Region			
54. Machine Tool Plant "Sergo Ordzhonikidze" Moscow APC: VII-167 RSFSR	Lathes Special production machines Milling machines Automatic and semiautomatic turret lathes, Models 123, 116, 1M36, 137, 118, 1A16-2, 116-2, 1B16-2, 118V, 118A, 118B, 117, 1M16, 1225-6 "Aggregate" and special machines, Models 1268, A-131, A-625, A-822, A-437, A-821, 1A397, 1A399 Four-spindle milling and centering semiautomatic machines, Models 4B1, 4B15 Pipe-threading machines, Models 9143, 9145	1939 2,160 units 1948 2,300 units 1950 3,500 units	Reported in Nov 1943 that recently produced 15,000th turret lathe; made 12,000 type-136 lathes during 13 years of operation; produced 2,000 semiautomatic lathes and about 1,000 lathes (Types 123, 126, 141, and other types) during the three Five Year Plans (Sep 1946). Until 1945 made only turret lathes and multiple spindle machines; in 1946 began to produce "aggregate" machines and then automatic lines; had 5,200 workers in 3 shifts in 1949; pledged to put out first of new cutting machines in Jan 1950; during first quarter of 1950 will make 2 automatic transfer lines of 20 machines each, each line being 80 meters long; plant was started in 1928 and produced first machine tool in 1932; in 1949 was one of largest machine-tool plants in USSR; in 1948, output was divided as follows: 45 to 50 percent general-purpose tools, 30 percent special tools and 20 to 25 percent "aggregate" tools; has a branch plant in Tula which also supplies castings; "Stankolit" in Moscow is chief supplier of castings; has own research laboratory; Volkov is Director.

i. "In 1949 this plant discontinued production of turret lathes and concentrated entirely on automatic and transfer machines." Vestnik Mashinostroyeniya, April 1951, pp. 1-2. Discontinuance of such production will necessarily reduce the number of units estimated for 1950.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Central Industrial Region			
55. Moscow Grinding Machine Plant "MSZ" (formerly Samotochka Plant)* Moscow	Hob grinder drill grinder, Model 34642 Universal lapping machine, Model 3616 Universal surface grinding machines, Models 372-AM, 3734, SK 371, 3756 Drill grinders, Models 38652, 3659 Cylinder and cone grinding machines, Models 315M, 315 Semiautomatic (Sphero) grinding machines, Models 3484N, 3484V Thread grinding machines Surface grinding machines, Models 345, SK 371A, 373, 3795, 3772, 372B, 3756, 3772-N17, 3772-N19, 3772-N29, 3772-N31 Semiautomatic grinders for faces of barrel-shaped rollers, Models Msh-26, Msh-25 Polishing machine, Model Msh-23 Two-spindle surface grinding semiautomatic machines, Models 3772, 37/22E Machine tool for grinding boring bits, Model 367 Splines-grinding semiautomatic machine, Model 345 Semiautomatic machine for grinding piston-ring faces, Model 3317 Universal tool grinding machine, Model 3464 Special grinding machines: Model SH-7 for optical industry and Models SH-8, SH-10, SH-11 for motor vehicle and tractor industry	1939 1948 1950	Largest producer of universal surface grinding machines; produces an average of 15 types a month; cylinder and cone grinder, Model 315, was intended for war industry; during the war, 50 percent conversion to war production; well-equipped; "Stankolit" in Moscow supplies castings; V. Glukharev is Director; 2,400 workers in 3 shifts.
AFC-VII-167 RSFSR		840 units 1,150 units 1,450 units (plan)	

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Central Industrial Region</u>			
56. Internal Grinding Machine Plant (formerly Stankonormal)* Moscow	Grinding and polishing machines New-type boring machine (using coordinates like Swiss SIP), Model 2L50 Polishing machine for bearings, Model 3L8MH Centerless grinding machines, Models 3L80, 3L83MT, 3L8LN26, 3L8LN10 Internal grinding machines, Models 3L3, 3L3S, 325SF, 3250, 325L, 3255 Universal grinding machines, Models 325D, 3250 Special grinding machine, Model SHP-10 Universal thread grinder, Model MM-582	1930 840 units 1939 204 units 1940 130 units 1945 1,300 units 1948 1,200 units 1950 1,500 units	Included in the wide variety of grinding machines made here are those used for grinding large-size bearing rings, centerless grinders, cylindrical and surface grinders, and saw grinders; V. A. Ruzkin was Director in 1949; reported as meeting 1947 plan schedule; new "Stankonormal" Plant has been set up to make parts for machine-tool factories; large 30-ton grinder to be exhibited in Moscow by Minister of Machine Tool Building, along with other machine tools produced at Kolomna, Minsk, Kharkov, and Moscow in 1950; production drop to 1,200 a year in 1948 reportedly caused by concentration on more intricate and special-type grinders; employed 2,300 workers in 1949 in 3 shifts; not to be confused with the Moscow Grinding Machine Factory (MSZ).
AFC: VII-167 RSFSR			
57. "Terek" No. 7 Machine Tool Plant* Kolomna	Screw-cutting lathe, Model 1D65 Lathe, Model DP 500 Gear-cutting machines Gear-milling machine, Model 5330	1949 300 to 500 units 1950 600 to 800 units	Employs 4,100 workers, including 1,600 POW's; plant recently modernized and enlarged; gear-cutter capacity 1 1/2 meters in diameter; exporting lathes to Rumania and Bulgaria; factory in poor condition; operated 3 shifts a day in 1948; made tanks and guns during the war; lathe is a copy of machine produced by German firm at Wohlenberg, Hanover; new section of plant began production in Oct 1949, when it was 95 percent completed; also produces transformers, pumps, and welding equipment.
AFC: VII-167 RSFSR			

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Central Industrial Region</u>			
58. Machine Tool Plant "Kalinin" Kineshma AFC: VII-154 RSFSR	Lathes Machine-tool parts	1950 200 units	Has own foundry; old factory not damaged during the war; no information since 1948; also produces machinery for shell production and industrial machinery such as pulp machinery and distillation units.
59. Machine Tool Plant "Komsomolets" * Yegoryevsk AFC: VII-166 RSFSR	Gear-milling machine, Model Ye2-1 Gear shaper, Model 511 Gear slotters, Models 5A12, 514, 534 Semiautomatic hobbors, Models 532, 5326, 533 Gear shapers, Models 571, 526 h/ Gear-finishing machines, Models 5715, 572 h/ Lapping machine, Model 573 Lapping machine, Model 5735 Gear-chamfering machines, Models 550, 557 Machine for testing gears for noise, Model 5798	1939 480 units 1940 1,295 units 1949 1,350 units 1950 1,400 units	Founded in 1909; has own foundry; during the war produced shell lathes and tank and aircraft parts; evacuated to Urals in 1941; 2,500 employees in 1947, working in 3 shifts; originally a technical school; became a machine-tool factory in 1932; Kazakov is Director.
60. Machine Tool Plant "Kuibyshev" ** Ryazan AFC: VII-166 RSFSR	Lathes Boring machines	1942 4,000 units 1950 2,000 units (Plan)	Under construction in 1941; making boring and special machinery in 1946; scheduled to be in full operation in Jul 1949.

E. Produced in Light Duty Combination Machine Tool Plant, which is probably another name for the Machine Tool Plant "Komsomolets."

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Central Industrial Region</u>			
61. Machine Building Works ** Tula APC: VII-167 RSFSR	Grinders Drill presses Milling machines	1950 1,000 units	1948 production was up 51 percent over 1947; made munitions during war.
62. Machine Building Plant "Stalin" Voronezh APC: VII-234 RSFSR	Lathes	1950 200 units	Reported to have built lathes in 1946 for an agricultural machinery plant in Novosibirsk.
<u>Urals Region</u>			
63. Machine Tool Plant * Alapuevsk APC: VIII-156 RSFSR	Turret lathe, Model 1325 Turret lathe, Model 1K36 Machine for lapping cutters, Model 3818	1942 1,100 units (Plan) 1948 700 to 800 units 1950 2,000 units (2,400 units planned)	Under construction in 1942; has foundry, forge, and machine shop; plan calls for 200 units a month; machinery from Union Werke, Saxony, Germany; handicapped other plants by not meeting 1948 production because of poor organization and planning; employs 1,000 workers in three 8-hour shifts, 7 days per week; plant started in 1943, and in Sep 1946 the 5,000th lathe was produced.
64. Machine Tool Plant Beloretsk APC: VIII-164 RSFSR	Lathes, including rifle-boring lathes	1944 360 units 1950 500 units	For period Nov 1942 to Mar 1943 this plant was third highest among machine tool plants; 1,000 employees May 1943; Khuyeshenko is Director.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Urals Region			
65. Machine and Armaments Plant Izhevsk AFC: VIII-155 RSFSR	Screw-cutting lathe, Model 1620 Horizontal boring mill, Model 2621 Vertical drilling machine, Model 2121 Six-spindle automatic lathe, Model 1225-6 Milling machines Drill presses	1950 500 units	Second largest rifle plant in USSR; had from 30,000 to 50,000 employees in 1942; plant also produces rifles, motorcycles, and hand tools.
66. Machinery Plant * Chkalov AFC: VII-236 RSFSR	Shapers, Models 7A35, 736 Slotter, Model 7H17	1950 400 units	1,000 workers; plant also produces wood- planing machines and automatic punches.
67. Machine Tool Plant ** Troitsk AFC: VIII-165 (Chkalov Oblast) RSFSR	Lathes Power hacksaw, Model 872 Pipe cutting-off machine, Model 9122	1947 1950 480 units 600 units	1,500 employees in 1946.
68. Lathe Plant Asbest AFC: VIII-156 RSFSR	Lathes	1950 200 units	500 workers.
69. Machine Tool Plant "Stanko" or "Gorki" Kizel AFC: VIII-156 RSFSR	Turret lathes	1948 1950 Reported as having produced 40 units in a 2-week period 800 units	700 employees in three 8-hour shifts; has own foundry and 4 blast furnaces; moved from Kiev to Kizel during the war; made T-34 tanks during the war; also produces punching tools.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
Urals Region			
70. Machinery Plant "Lenin" Sterlitamak APC: VIII-165 RSFSR	Boring and drilling machines	1948 1,200 units (Plan) 1950 1,500 units	1,000 to 2,000 workers in three 8-hour shifts, 7 days a week; equipped with machinery from former Hiltnerwerke at Dresden, Germany; Nikovaev is Director; has own foundry; 35-mm. capacity drill press made here was displayed in Bucharest on 13 Nov 1948.
71. Machine Tool Plant "Ordzhonikidze" * Sverdlovsk APC: VIII-156 RSFSR	Lathes	1948 150 units (Plan) 1950 250 units	Built 3,000-ton press in 1947; built 750-ton hydraulic press in 1946 for forging railroad wheels; little machine-tool production, except for special units, is believed to take place; also produces hydraulic presses, heavy machinery, and cranes.
72. Machine Tool Plant "Lenin" ** Zlatoust APC: VIII-164 RSFSR	Surface grinding machines	1950 300 units	2,700 employees in 3 shifts in 1942; equipment included three open-hearth and one electric furnace, three rolling mills, foundry, pattern shops, heat-treating department, and machine shop; also produces instruments and cutting tools.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>West Siberia Region</u>			
73. Machine Tool Plant "16th Party Congress" Zavod 16 Novosibirsk AFC: IX-162 RSFSR	Thread-cutting lathes Combination lathe, Model S-195	1948 720 units 1950 800 units	3,000 employees in three 8-hour shifts in 1947; equipment from Siemens Plant, Berlin; Sliozberg was Director in July 1948; has own foundry; quality of lathes poor; number of rejects high; produces an automatic spring washer machine, Model A-453, various consumer goods (flatirons, kitchen ranges, and grate bars), and various castings and forgings to order.
74. Voskov Tool Plant Novosibirsk** AFC: IX-162 RSFSR	Drill presses (capacity 1½ in.)	1942 450 units 1950 500 units	500 workers in 3 shifts in 1948; also produces hand tools and pneumatic drills.
75. Tyash-tankogidropress Plant* (Krovozhchakov-suburb) Novosibirsk AFC: IX-162 RSFSR	Lathes Milling machines Vertical boring machines, Models IP-15, 265-V, 1318 Planer, Model 724	1950 1,000 units	2,000 workers in three 8-hour shifts in 1948; has own foundry still under construction in 1949; Polyakov was Director in 1949, Savin was Chief Engineer; scheduled to be one of the largest plants of its kind in the world; has own steel mill; also produces pumps, hydraulic presses, and forging presses, Models KHU-800, 360, and GU-200.
76. Automatic Machine Plant Tomsk AFC: IX-153 RSFSR	Automatic lathes	1942 600 units (Plan) 1950 700 units	

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>West Siberia Region</u>			
77. Stanko Zvobata Machine Plant Tomsk AFC: IX-158 RSFSR	Metal tools	1950 200 units	
78. Mechanical Press Plant * Barnaul AFC: IX-162 RSFSR	Lathes	1950 300 units	Capacity, 20,000 tons of castings a year; started operations in 1944; most items produced are press (cold stamping).
79. Machine Tool Plant No. 386 * Slavgorod AFC: IX-162 RSFSR	Type unknown	1950 500 units	800 employees in 1943; also produces forge presses.
<u>Kazakhstan and Central Asia Region</u>			
80. Agricultural Machinery Plant No. 735 Tashkent AFC: X-328 Uzbek SSR	Turret lathes	1946 120 units 1950 500 units	Under Ministry of Agricultural Machine Building; main production is agricultural machinery; reported producing 10 turret lathes a month in 1946; also produces agricultural machinery.

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Plant and Location	Types of Machine Tools Produced	Estimated Plant Production	Remarks
<u>Kazakhstan and Central Asia Region</u>			
81. Machine Tool Plant Frunze APC: X-328 Kirgiz SSR	Lathe, Model T-60 Milling machines Boring machines (URP-VP) Cylinder-block boring machine, Model 2685 Boring machine for machining cylinder blocks and sleeves, Model 2A697	1950 350 units	
<u>East Siberia Region</u>			
82. Tool Factory No. 4 Irkutsk APC: XI-200 RSFSR	Lathes and screw-cutting machines	1946 14 units 1947 23 units 1948 28 units 1950 350 units	450 employees in Aug 1948; Tarnopolski is Director and Novikov is Assistant Director; under Ministry of Local Industry in 1948; also produces hand tools and job forgings.
83. Machine Building Plant "Sheldom" Artemovsk APC: XI-160 RSFSR	Lathes Drill presses	1950 300 units	Plant reported producing lathes and drill presses in 1949.
<u>Soviet Far East Region</u>			
84. Machine Tool Plant Vladivostok APC: XII-282 RSFSR	Type unknown	1950 200 units	No other information since 1947.
85. Machinery Plant Magadan APC: XII-131 RSFSR	Milling machines Lathes	1950 200 units	No other data since 1947.

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